

CLAIMS

What is claimed is:

5 1. A process for removing a source-derived contaminant from a hydrocarbon-containing material, comprising
 contacting the hydrocarbon-containing material with a clay in a filter apparatus, at least part of the source-derived contaminant being sorbed by the clay; and
10 removing hydrocarbon-containing material from the filter apparatus, wherein the removed hydrocarbon-containing material comprises a reduced amount of the source-derived contaminant.

15 2. The process of claim 1, wherein the source-derived contaminant is a polymer-derived contaminant.

20 3. The process of claim 1, wherein the source-derived contaminant comprises one or more of an organic chlorine compound, a nitrogen compound, sulfur or an organic or inorganic sulfur compound, color, or an offensive or non-hydrocarbon odor.

 4. The process of claim 1, wherein the contacting is conducted at an elevated temperature.

25 5. The process of claim 4, wherein the contacting has been conducted at a temperature from about 300°C to about 500°C.

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6. The process of claim 1, wherein the hydrocarbon-containing material is obtained from thermal decomposition of polymeric or other organic materials.

5 7. The process of claim 6, wherein the polymeric material comprises an unsorted mixture of a plurality of thermoplastic polymeric materials.

8. The process of claim 6, wherein the other organic material comprises one or more of animal offal, manure, crop residuals and plant
10 residuals.

9. The process of claim 1, wherein the clay comprises Fuller's earth.

10. A process for producing hydrocarbons from a polymeric material,
15 comprising:

(a) thermally decomposing polymeric material to obtain a first hydrocarbon-containing material comprising one or more polymer-derived contaminant;

(b) contacting the first hydrocarbon-containing material with a clay
20 material to form a clay-hydrocarbon-containing material mixture, whereby at least a portion of the polymer-derived contaminant is sorbed by the clay material to form a clay-contaminant adduct; and

(c) separating a second hydrocarbon-containing material from the mixture, wherein the second hydrocarbon-containing material comprises a
25 reduced amount of the polymer-derived contaminant.

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11. The process of claim 10, further comprising (d) heating the clay material and the clay-contaminant adduct to an elevated temperature to regenerate the clay material.

5 12. The process of claim 11, wherein in (d) the clay material and the clay-contaminant adduct are heated to a temperature in a range from about 400°C to about 815°C.

10 13. The process of claim 11, further comprising (e) providing the regenerated clay material from (d) to (b).

14. The process of claim 13, further comprising repeating steps (a)-(e).

15 15. The process of claim 10, wherein the polymer-derived contaminant comprises one or more of an organic chlorine compound, a nitrogen compound, sulfur or an organic or inorganic sulfur compound, color, or an offensive or non-hydrocarbon odor.

20 16. The process of claim 10, wherein in (a) the polymeric material comprises an unsorted mixture of a plurality of thermoplastic polymeric materials.

17. The process of claim 10, wherein in (a) the polymeric material is thermally decomposed at a temperature from about 300°C to about 500°C.

25 18. The process of claim 10, wherein the second hydrocarbon-containing material has one or more characteristic out of specification for a desired use.

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19. The process of claim 18, further comprising (f) blending the second hydrocarbon-containing material with a petroleum-derived or synthetic hydrocarbon material to adjust one or more said characteristic to meet specification for the desired use.

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20. The process of claim 19, wherein the another petroleum-derived or synthetic hydrocarbon material comprises a recycled material.

21. The process of claim 20, wherein the recycled material comprises one or more of engine lubricating oil, gear oil or fuel oil.

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22. The process of claim 18, wherein the desired use is as one or more of a motor vehicle fuel, a lubricant, a hydraulic fluid, and a solvent.

23. The process of claim 10, wherein, in addition to the first hydrocarbon material, (a) yields a second combustible material.

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24. The process of claim 23, wherein the second combustible material is combusted as a heat source in the process.

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25. A process for producing a hydrocarbon suitable for use in a motor vehicle from a recycled polymeric or other organic material, comprising:

(a) providing a first hydrocarbon-containing material obtained from thermal decomposition of a recycled polymeric or other organic material, wherein the first hydrocarbon-containing material comprises one or more source-derived contaminant;

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(b) contacting the first hydrocarbon-containing material with a clay material to form a clay-hydrocarbon-containing material mixture, whereby at least

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a portion of the source-derived contaminant is sorbed by the clay material to form a clay contaminant adduct;

(c) separating a second hydrocarbon-containing material from the mixture, wherein the second hydrocarbon-containing material comprises a reduced amount of the source-derived contaminant, and wherein the second hydrocarbon-containing material has one or more off-specification characteristic relating to use in a motor vehicle;

(e) providing another hydrocarbon material, wherein the another hydrocarbon material has one or more characteristic for offsetting the one or more off-specification characteristic; and

(f) blending the second hydrocarbon-containing material with the another hydrocarbon to obtain a hydrocarbon wherein the one or more characteristic is within specification for use in a motor vehicle.

26. The process of claim 25, further comprising (d) heating the clay and the clay-contaminant adduct to a temperature in a range from about 400°C to about 815°C to regenerate the clay material, and providing the regenerated clay material to (b).

27. The process of claim 25, wherein the process is continuous and further comprises (g) repeating steps (a)-(f).

28. The process of claim 25, wherein the use in a motor vehicle comprises one or more of use as a fuel, a lubricant and a hydraulic fluid.

29. A process for producing a hydrocarbon suitable for a desired use from a recycled polymeric or other organic material, comprising:

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(a) providing a first hydrocarbon-containing material obtained from thermal decomposition of a recycled polymeric or other organic material, the first hydrocarbon-containing material comprising one or more source-derived contaminant;

5 (b) contacting the first hydrocarbon-containing material with a clay material to form a clay-hydrocarbon-containing material mixture, whereby at least a portion of the source-derived contaminant is sorbed by the clay material;

(c) separating a second hydrocarbon-containing material from the mixture, wherein the second hydrocarbon-containing material comprises a
10 reduced amount of the source-derived contaminant, wherein the second hydrocarbon-containing material has one or more characteristic requiring adjustment for a desired use;

(e) providing another hydrocarbon material, wherein the another hydrocarbon material has one or more characteristic for offsetting the one or
15 more characteristic requiring adjustment; and

(f) blending the second hydrocarbon-containing material with the another hydrocarbon to obtain a blended hydrocarbon-containing material wherein the one or more characteristic is within specification for the desired use.

20 30. The process of claim 29, further comprising (d) heating the clay and the clay-contaminant adduct to a temperature in a range from about 400°C to about 815°C to regenerate the clay material, and providing the regenerated clay material from (d) to (b).

25 31. The process of claim 29, wherein the process is continuous and further comprises (g) repeating steps (a)-(f).

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32. A process for producing a hydrocarbon suitable for a desired use from a recycled polymeric or other organic material, comprising:

5 (a) providing a first hydrocarbon-containing material obtained from thermal decomposition of a recycled polymeric or other organic material, wherein the first hydrocarbon-containing material comprises one or more source-derived contaminant and has one or more characteristic requiring adjustment for a desired use;

10 (e) providing another hydrocarbon material, wherein the another hydrocarbon material has one or more characteristic for offsetting the one or more characteristic requiring adjustment;

(f) blending the first hydrocarbon-containing material with the another hydrocarbon to obtain a blended hydrocarbon-containing material wherein the one or more characteristic is within specification for the desired use;

15 (b) contacting the blended hydrocarbon-containing material with a clay material to form a clay-hydrocarbon-containing mixture, whereby at least a portion of the source-derived contaminant is sorbed by the clay material; and

20 (c) separating a second hydrocarbon-containing material from the mixture, wherein the second hydrocarbon-containing material comprises a reduced amount of the source-derived contaminant and has the one or more characteristic within specification for the desired use.

25 33. The process of claim 32, further comprising (d) heating the clay and the clay-contaminant adduct to a temperature in a range from about 400°C to about 815°C to regenerate the clay material, and providing the regenerated clay material from (d) to (b).

34. The process of claim 32, wherein the process is continuous and further comprises (g) repeating steps (a)-(f).